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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,160	11/18/2003	Ronald S. Cok	84807ADAN	5284

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EXAMINER

PERRY, ANTHONY T

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

8/2

Office Action Summary	Application No. 10/716,160	Applicant(s) COK ET AL.	
	Examiner Anthony T. Perry	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/07/06 has been entered.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the optical cavities must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites, "whereby the display device has a reduced color change dependency on viewing angle and an apparent sharpness of the display device is improved." It is unclear what the device is being compared to (i.e. reduced or improved compared to what). For purposes of examination, the examiner has interpreted it to be compared to prior art displays having conventional faceplates. It is noted that the functional limitations are therefor inherent in the combinations below that use fiber-optic faceplates.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Briggs et al. (US 5,131,065) in view of Roitman et al. (US 6,680,570).

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Regarding claims 1 and 20, the admitted prior art discloses an OLED display device comprising a substrate (12), an array of OLED elements (30,19,18) formed on the substrate (12) and an encapsulating cover (36) disposed over the OLED elements (30,19,18) wherein the light emitted is incoherent (for example, see Fig. 1 of the present application). The prior art admitted by the applicant teaches a transparent substrate as the faceplate and not specifically a fiber-optic faceplate.

The Briggs reference however teaches an OLED display device that uses a fiber-optic faceplate (see for example Fig. 3). Fiber-optic faceplates exhibit lower percentages of internally reflected light rays and, therefore, provide greater luminance and better contrast than prior art faceplates. Accordingly one of ordinary skill in the art would have found it obvious to use a fiber-optic faceplate as taught by Briggs in place of the transparent substrate of the admitted prior art in order to provide greater luminance and better contrast. The prior art admitted by the applicant and the Briggs reference do not specifically teach the OLED elements defining an optical cavity.

However, the Roitman reference teaches the OLED elements defining an optical cavity so as to provide an improved OLED that has a predictable color output (for example, see col. 1, lines 40-44 and col. 2, lines 41-64). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the OLED elements define an optical cavity so as to provide an OLED with better color control.

Regarding claim 2, Roitman teaches the OLED elements comprising a first electrode; one or more layers of light emitting organic material formed on the first electrode; an electrode formed on the one or more layers of organic material; and wherein one of the electrodes is

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reflective and the other is partially reflective, and the electrodes being spaced apart by a sufficient distance to define an optical cavity in which light emitted from the organic material through the partially reflective electrode has a reduced angle of emission (for example, see col. 2, line 41 – col. 3, line 10).

The combination of claim 1 applies.

Regarding claim 3, fig. 1 of the present application shows a bottom-type emitter, which means that the substrate is the faceplate. The admitted prior art does not specifically teach the encapsulating cover being opaque or reflective. However, it is well known to have an opaque encapsulating cover in a bottom-type emitting OLED display device. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the encapsulating cover be opaque so as to provide a bottom emitting OLED display device with excellent contrast.

The combination of claim 1 applies.

Regarding claim 4, the prior art admitted by the applicant teaches that OLED devices can be top-type emitters, in which case the encapsulating cover acts as the faceplate which emits light. In the case where a top emitter is used, one of ordinary skill in the art would have found it obvious to use a fiber-optic faceplate as the encapsulating cover. Fiber-optic faceplates exhibit lower percentages of internally reflected light rays and, therefore, provide greater luminance and better contrast than prior art faceplates. Accordingly one of ordinary skill in the art would have found it obvious to use a fiber-optic faceplate as taught by Briggs in place of the encapsulating cover of the admitted prior art in order to provide greater luminance and better contrast. Since only the cover needs to emit light one of ordinary skill in the art would have found it obvious to

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have utilized an opaque substrate so as to provide a top-emitting OLED display device with excellent contrast.

Regarding claim 5, the admitted prior art teaches that top emitting devices are the same as bottom emitting devices except that the cover 36, the second electrode 30, and the protection layer 32 are transparent (see fig. 1). Since the top emitting devices emit light from the OLED material 19 through the cover 36, one of ordinary skill in the art would have found it obvious to fill the gap 34 with a transparent material rather than an opaque or reflective material so that the light emitted from the OLED material 19 can be emitted through the cover 36 which acts as the faceplate of the device 10.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Briggs et al. (US 5,131,065) in view of Roitman et al. (US 6,680,570) as applied to claim 1, above, further in view Yamanaka (US 5,751,383).

Regarding claim 11, the Briggs and Roitman references do not specifically teach only one fiber per OLED element (pixel). However, Yamanaka teaches an image display device that includes only one fiber per pixel in order to prevent crosstalk between adjacent pixels as well as eliminate a shadow area between the adjacent pixels (see col. 15, lines 23-53 and Fig. 15). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include only one fiber per OLED element of the Briggs device so as to further improve the resolution of the device by preventing crosstalk and shadowy areas between adjacent pixels of the display.

Regarding claims 12-13, the admitted prior art, Briggs, and Roitman do not specifically teach OLED elements in groups wherein the elements are differently colored elements.

However, it is well known in the art to provide a pixel made up of sub-pixels of different colors, commonly red, green, and blue, in order to provide a color display. One of ordinary skill in the art would have found it obvious at the time the invention was made to replace the monochrome pixels of the Briggs reference with pixels comprising sub-pixels of different colors in order to provide a preferable color display.

The admitted prior art, Briggs, and Roitman do not specifically teach only one fiber per group of OLED elements (R, G, and B sub-pixels making up a pixel). However, Yamanaka teaches an image display device that includes only one fiber per group of sub-pixels forming a pixel in order to eliminate a shadow area between the adjacent pixels and to improve color mixing of the sub-pixels (see col. 15, line 54 – col. 16, line 3 and Fig. 16). Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include only one fiber per group of OLED element of the combined device so as to further improve the resolution of the device by improving the color mixing of each pixel and preventing the appearance of shadowy areas between adjacent pixels of the display.

Regarding claims 16-18, Roitman teaches a reflecting coating provided under a transparent conducting anode and that either the reflecting coating or the cathode is chosen such that part of the light generated in the device can be transmitted through one of the reflecting coating or the cathode (for example, see col. 3, lines 5-10). In the case that a bottom-emitting display is desired, the cathode (second electrode) is reflective and the anode (first electrode) is partially reflective, and comprises a transparent conductor such as ITO and a partially reflective mirror so that the light may be emitted through the anode. In the case that a top-emitting display

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is desired, the anode (first electrode) is reflective and the cathode (second electrode) is partially reflective so that the light may be emitted through the cathode.

Combination of claim 1 applies.

Regarding claim 19, the admitted prior art, Briggs, and Roitman fail to specifically teach an OLED emitting coherent light. However, OLEDs that use optical cavities in order to produce coherent light are well known in the art. One of ordinary skill in the art would have found it obvious at the time the invention was made to produce an OLED that emits coherent light for use in applications that require lasers.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Briggs et al. (US 5,131,065) in view of Roitman et al. (US 6,680,570), as applied to claim 1 above, and further in view of Webster (US 5,274,405).

Regarding claims 6-7, the combination of the applicant's prior art and Briggs fails to specifically teach the use of a fiber optic faceplate that is flat on one side and curved on the other. However, Fig. 8 of Webster shows a fiber optic faceplate 80 with the side connected to the image producing device 77 being flat and the light emitting output side 78a of the faceplate being curved. The fiber optic cables and interfaces allow images displayed on a flat surface to be displayed on a curved surface such as that used in a head-mounted viewing system to allow for the image to be displayed in both the viewer's area of visual attention and the area of the viewer's peripheral vision (col. 3, lines 10-23).

Accordingly, one of ordinary skill in the art would have found it obvious to use a fiber optic faceplate that is flat on the side mounted to the OLED flat device and curved on the light emitting side of the faceplate so as to display the image produced by the OLED device on a

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curved surface such as that used in a head-mounted viewing device so that visual information in the peripheral field of view is displayed resulting in a more realistic visual environment.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Briggs et al. (US 5,131,065) in view of Roitman et al. (US 6,680,570), as applied to claim 1 above, and further in view of Melville (US 6,205,275).

Regarding claim 8, the combination of the applicant's prior art and Briggs fails to specifically teach the use of an image magnifying fiber optic faceplate. However, Melville teaches a coherent fiber optic plate that transmits either a magnified or minified image from its input surface to its output surface. The magnification (or minification) ratio is the ratio of the diameters of the large and small ends of the taper. Since light can pass through the taper in either direction, a taper serves equally well to magnify or minify (reduce) an image. Melville teaches that representative tapers, as well as fiber optic face plates and fiber optic image guides, are commercially available (col. 7, lines 33-42). Accordingly, one of ordinary skill in the art at the time the invention was made would have found it obvious to use a magnifying fiber optic faceplate in order to enlarge or reduce the size of the image produced from the OLED device as desired.

Regarding claims 9-10, Melville teaches a fiber-optic faceplate that can enlarge or reduce the size of a viewed image.

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Briggs et al. (US 5,131,065) in view of Roitman et al. (US 6,680,570), as applied to claim 1 above, and further in view of Lowry et al. (US 6,396,985).

Regarding claim 14, the combination of the applicant's prior art and Briggs fails to specifically teach the use of a tapered faceplate. However, Fig. 4 of the Lowry reference teaches the use of a tapered faceplate that has a smaller light receiving surface 320 and a larger light-emitting surface 330. One of ordinary skill in the art would have found it obvious at the time of the invention to use such a device in order to magnify the image of the OLED device and display it on a larger surface so that a group of people can view the OLED device's image.

Regarding claim 15, Fig. 2 of Lowry shows a tiled display including an array of such devices, wherein the edges of the light-emitting surfaces of the faceplates are abutting.

Rejection of claim 14 applies.

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kumar et al. (US 5,926,239) also teaches a display device using only one fiber per pixel (see for example fig. 19).

Response to Arguments

Applicant's arguments filed 2/07/06 have been fully considered but they are not persuasive.

In response to the argument that the Applicant's that Roitman teaches against combining a fiber-optic faceplate as taught by Briggs, the Examiner respectfully disagrees. Roitman teaches that the optical cavities are provided in order to improve the predictability of the color output of the display. Nowhere in Roitman is it recited that the improved predictable color output is only valid in a viewing direction normal to the display. Roitman also does not state that the display

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must be viewed through a typical glass substrate or encapsulate in order for the improvement in predictable color output to exist.

The Applicant further admits that the use of optical cavities in OLED displays is well known as is their purpose. The use of fiber-optic faceplates as well as their purpose (providing greater luminance and better contrast) is also well known. The Applicant has altered nothing in the optical cavities that in conjunction with the fiber-optic faceplate provides the specified function. The fact that applicant has recognized another advantage (that the use of a fiber-optic faceplate with an OLED display device reduces the color change dependency on viewing angle) which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to *Anthony Perry* whose telephone number is (571) 272-2459. The examiner can normally be reached between the hours of 9:00AM to 5:30PM Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-24597. **The fax phone number for this Group is (571) 273-8300.**

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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February 19, 2006



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